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LAND MOBILE COMMUNICATIONS COUNCIL

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April 28, 1993

Ms. Donna R. Searcy
Secretary
Federal Communications Commission
1919 M Street, N.W., Room 222
Washington, D.C. 20554

RE: PR Docket No. 92-235; Consensus Plan Developed by the Land Mobile Communications Council ("LMCC")

Dear Ms. Searcy:

In its February 9, 1993, "Motion for Extension of Time" in the above-referenced proceeding, the Land Mobile Communications Council ("LMCC") committed to filing, on April 28, 1993, a "Consensus Plan" proposing measures to facilitate the process of refarming the spectrum below 800 MHz.

LMCC's Motion for Extension of Time was granted by Order, DA 93-145, released February 9, 1993.

The enclosed "Consensus Plan" is the result of lengthy study and deliberations by the members of LMCC. We believe this Plan presents a very practical approach for implementing a "graceful migration" to more efficient technologies.

In view of the significant issues under consideration in this proceeding, LMCC requests that the Commission provide Public Notice of this "Consensus Plan" at its earliest convenience. In this way, commenters will have an opportunity to address the "Consensus Plan" in their comments to be filed with

cc: Commissioners
Mr. Ralph A. Haller
Dr. Thomas P. Stanley
Beverly G. Baker, Esq.
Richard J. Shiben, Esq.
Kent Y. Nakamura, Esq.
Mr. F. Ronald Netro
Edward R. Jacobs
Rosalind K. Allen, Esq.
Dr. Joseph A. Levin
Dr. Doron Fertig
Mr. Eugene Thomson

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Replacement of Part 90 by	)	
Part 88 to Revise the	)	**PR Docket No. 92-235**
Private Land Mobile Radio	)	
Services and Modify the	)	
Policies Governing Them	)	

To: The Commission

CONSENSUS PLAN
Developed By the Land Mobile Communications Council To Introduce Greater Efficiencies in PLMRS Bandwidths and Power Levels

THE LAND MOBILE COMMUNICATIONS COUNCIL

Douglas M. Aiken
President

John B. Richards
General Counsel

April 28, 1993

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SUMMARY

The Land Mobile Communications Council has developed the attached "Consensus Plan" to assist the Federal Communications Commission in its efforts to introduce greater efficiency in the use of the private land mobile radio spectrum. LMCC's Consensus Plan is intended to ensure a reasonable pace in implementation of efficient bandwidths and the requisite degree of flexibility in permissible power levels.

The Consensus Plan sets forth specific measures aimed at introducing 12.5 kHz bandwidths in the 421-512 MHz range. Under the Consensus Plan, all licensees seeking to ensure primary status for their systems would have to employ true 12.5 kHz equipment or equivalent efficiency no later than January 1, 2004. The Consensus Plan contains two options for introducing narrower bandwidths in the 150-174 MHz band, one premised on the introduction of 12.5 kHz bandwidths no later than 2004 and the other based on implementation of 6.25 kHz bandwidths by 2004.

To ensure that licensees' power levels are commensurate with their service area requirements, LMCC recommends adoption of a two-part procedure: (1) use of a "safe harbor" table of permissible ERP/HAAT combinations; or (2) submission of coverage contours demonstrating use of the minimum power necessary to meet

system requirements. The Consensus Plan sets forth specific ERP/HAAT tables for both the 150-174 MHz and 450-470 MHz bands.

The Consensus Plan also supports the introduction of exclusive channel assignments in the bands 150-174 MHz and 450-470 MHz but recommends certain refinements in the approach set forth in the Commission's proposal.

Finally, the Consensus Plan recommends that the Commission not adopt its proposal to set aside more than 250 frequency pairs in the 150-162 MHz band for "innovative shared use" systems.

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Replacement of Part 90 by Part 88 to Revise the Private Land Mobile Radio Services and Modify the Policies Governing Them	)	**PR Docket No. 92-235**

To: The Commission

CONSENSUS PLAN
Developed By the Land Mobile Communications Council
To Introduce Greater Efficiencies
in PLMRS Bandwidths and Power Levels

Following extensive consideration of the proposals set forth in the Federal Communications Commission's Notice of Proposed Rule Making ("NPRM") in the above-referenced proceeding[1], the Land Mobile Communications Council ("LMCC") has developed certain refinements of those proposals. LMCC offers these refinements in the form of its "Consensus Plan", before the official comment date, in the hope of promoting the Commission's efforts to introduce greater efficiencies and maximize the use of the available private land mobile radio spectrum.

1. On February 3, 1993, the Land Mobile Communications Council filed a Motion with the Commission requesting that the comment date in this proceeding be extended to May 28, 1993. LMCC requested this extension to provide an opportunity for its

[1] Notice of Proposed Rule Making adopted October 8, 1992, released November 6, 1992, 7 FCC Rcd 8105 (1992).

members to develop an industry consensus on issues that are fundamental to this proceeding. LMCC has been able to forge a

3. LMCC fully participated in the Commission's earlier Inquiry into the "refarming" of the private land mobile frequency bands below 512 MHz, PR Docket No. 91-170. LMCC's Comments and Reply Comments described a plan for graceful migration to more efficient technologies. LMCC intends to be an active participant in the present rule making proceeding, and has reached preliminary consensus on many of the important issues raised in the NPRM in the instant proceeding.

4. As a preliminary matter, LMCC is in agreement with the fundamental intent and direction of improving efficiency which underlies the Commission's proposals. Recognizing the need to make more intensive use of the existing spectrum, LMCC is committed to implementing more efficient operating practices and technologies at the earliest possible date, consistent with the needs of private land mobile users and the capabilities of equipment suppliers to deliver a full line of equipment which meets the diverse requirements of the user community.

5. LMCC agrees there is a need to make more efficient use of the existing PLMRS frequencies below 512 MHz and to encourage

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International Association of Fish and Wildlife Agencies
International Taxicab and Livery Association
Manufacturers Radio Frequency Advisory Committee
National Association of Business and
Educational Radio, Inc.
National Association of State Foresters
Telecommunications Industry Association
Telocator
Utilities Telecommunications Council

the implementation of technologically-advanced equipment in these bands. LMCC reaches this conclusion in large part because of grave concern that, even after refarming, the existing spectrum allocated for the Private Land Mobile Radio Services ("PLMRS") will not be sufficient to accommodate all of the private radio requirements during the coming century. This is particularly true for emerging technologies and services such as imaging and high-speed data, which require wider rather than narrower bandwidths.

6. On the other hand, LMCC questions whether the specific proposals set forth in the NPRM provide an adequate transition period for existing users to migrate to the narrowband technologies or whether the channelization proposed for the various bands provide sufficient flexibility to implement many of the spectrum-efficient technologies that are being developed. Many of LMCC's members are also concerned with the proposed limitations on effective radiated power. In response to these concerns, LMCC has developed an alternative transition plan intended to achieve the Commission's goal of greatly increasing the efficiency or capacity of land mobile radio systems within the next 20 years, but at a cost to users commensurate with the anticipated benefits.

7. LMCC notes that the Commission has consistently expressed concern that the rules ultimately adopted in this

proceeding should be crafted to prevent hardship on users of the private land mobile radio spectrum.[4] Accordingly, as the Commission recognizes, the measures adopted to promote more efficient use of the radio spectrum must reflect a careful balancing of costs to the industry and expected benefits.

8. The ensuing public policy analysis must also carefully balance the burdens imposed upon existing users of the spectrum with the needs of future users. In the hope of promoting an equitable balance of the competing concerns underlying this proceeding, LMCC proposes the following consensus plan aimed at ensuring a reasonable pace in implementation of efficient bandwidths and the requisite degree of flexibility in permissible power levels.

I. Migration Plan to Increase Capacity

9. The private land mobile bands at 150-174 MHz and 421-512 MHz currently support approximately 12 million base, mobile and portable transmitters. This represents an aggregate imbedded equipment investment by users of over $25 billion. Further, most private land mobile users place an extremely high priority on maintaining communications capability, and some users operate under severe budgetary constraints. Therefore, users

[4] See, for example, FCC Public Notice dated March 1, 1993, mimeo #31969.

rarely changeout an entire system at once. Accordingly, any refarming migration plan must adequately provide for the graceful transition and amortization of imbedded systems as well as a sufficient planning cycle to implement new technologies.

10. In addition, the essence of private radio is to provide a best-fit solution to a particular user's communications requirements. This requires a regulatory structure, as well as equipment, which supports the diverse needs of private land mobile users. System operations span the gamut from several low cost portables providing basic on-site voice communications to expansive industrial or public safety/public service systems providing voice and data communications to several hundreds or even thousands of employees. Users today can choose from a full line of products offered by competitive manufacturers which meet this wide range of requirements. A refarming migration plan must be structured such that private land mobile users continue to have these choices.

11. LMCC has developed the following recommended migration plan to meet the Private Radio Bureau's stated objective of quadrupling capacity in 20 years. In addition to increasing capacity, LMCC's plan attempts to provide users with a continued choice of competitive products and technologies which meet the diverse range of best-fit solutions required and offers a graceful transition to accommodate the need for gradual system

changeout, utilization of imbedded investment and sufficient planning cycles for system replacement. As the existing environment in the 150-174 MHz band differs from that in the 421-512 MHz bands, LMCC has developed separate plans for each band, as described below.

A. Frequencies in the 421-512 MHz Range

12. The Commission's proposal for the 421-512 MHz range was premised on the use of 6.25 kHz equipment by all new stations licensed after the effective date of the new rules (assumed to be January 1, 1994). The Commission also proposed that stations licensed before January 1, 1994 would have to convert to 12.5 kHz channelization no later than January 1, 1996. Stations in the top 15 markets licensed before January 1, 1994 would have to convert to 6.25 kHz bandwidths no later than January 1, 2004. Stations in smaller markets licensed before January 1, 1994 would be required to convert to 6.25 kHz bandwidths according to a graduated schedule stretching from 2005 through 2012. Accordingly, after January 1, 2012, all stations previously licensed for 25 kHz bandwidths, regardless of the area in which

a. Effective January 1, 1994, licensees on full power channels would have the option of employing true 12.5 kHz bandwidths on a voluntary basis.[5]

b. Effective January 1, 1994, a band plan based on 6.25 kHz channelization would be incorporated into the rules for voluntary use by licensees on a coordinated basis.

c. Effective January 1, 1994, the Commission would designate a percentage of the current offset channel pairs as primary, site-specific channels available for low or full-power operation.[6] All applications, including renewals, filed after January 1, 1994 for the channels designated as primary would have to provide coordinates for the transmitter site. Offset channels not designated for primary, site-specific operations would remain

channels by January 1, 2014.[7]

g. Effective January 1, 2004, all licensees not employing true 12.5 kHz equipment or equivalent efficiency could continue to operate but such operations would be on a non-interference basis.

B. Frequencies in the 150-174 MHz Band

14. The Commission's proposal would require that all new stations licensed after January 1, 1994 implement their systems using 5 kHz bandwidths. Further, stations licensed before January 1, 1994 would have to convert to 15 kHz bandwidth equipment by January 1, 1996. The proposal would require stations licensed before January 1, 1994 to convert to 5 kHz bandwidths beginning January 1, 2004, following the same schedule as for stations in the 421-512 MHz range. As with the 421-512 MHz range, LMCC believes that the Commission's proposed approach for 150-174 MHz requires some refinement.

15. Both the environment at 150-174 MHz and the benefits to be gained from an interim conversion to 12.5 kHz or 15 kHz

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[7] LMCC notes that considerable uncertainty remains concerning the practicality of implementing bandwidths less than 12.5 kHz. LMCC proposes the follow-up rule making as a desirable means of assessing, at a later date, factors deemed relevant to the practicality of introducing narrower bandwidths. Additionally, there is abundant concern that the conversion to narrower bandwidths not foreclose the use of more efficient technologies that may require larger bandwidths. In this sense, LMCC urges the Commission to ensure that the rules governing implementation of more efficient bandwidths are sufficiently flexible to accommodate technologies offering "equivalent efficiencies".

bandwidths in that band are somewhat different than for 421-512 MHz. For this reason, LMCC is currently considering two alternative strategies for introducing narrower bandwidths in the 150-174 MHz band. Each of these alternatives offer countervailing benefits. There are those among LMCC's membership who have a decided preference for Option A, and there are other members who clearly favor Option B.[8] LMCC is therefore not in a position to endorse either option with unanimity. LMCC believes, however, that it is helpful to present both options in order to promote careful consideration of the available alternatives. Accordingly, in an effort to focus the discussion on this issue,

a. Effective January 1, 1994, licensees on full power channels would have the option of employing true 12.5 kHz bandwidth equipment on a voluntary basis.

b. Effective January 1, 1994, the Commission would establish a new 12.5 kHz frequency plan designating the 12.5 kHz frequency associated with each of the current 15 kHz frequencies.

c. Effective January 1, 1994, a band plan based on 6.25 kHz channelization would be incorporated into the rules for voluntary use by licensees on a coordinated basis.

d. Effective January 1, 1996, all equipment type accepted by the Commission (other than for use on designated paging channels) must be capable of operating on true 12.5 kHz bandwidths or with equivalent efficiency and on both the 15 kHz and 12.5 kHz channel centers.

e. By January 1, 1999, the Commission would commence a follow-up rule making to examine whether to require all licensees to convert to 6.25 kHz channels by January 1, 2014.

f. Effective January 1, 2004, all licensees not employing true 12.5 kHz equipment or equivalent efficiency could continue to operate but such operations would be on a non-interference basis.

g. Licensees would be allowed to move to the newly designated 12.5 kHz frequencies in advance of January 1, 2004 on a coordinated basis with notification to all licensees within the affected frequency block.

h. Effective April 1, 2004, the Commission would begin licensing operations on the unassigned seventh frequency within each block of six existing frequencies. License assignments would be permitted on each of the seventh frequencies before April 1, 2004 on a coordinated basis where users in a geographic area have converted to 12.5 kHz equipment and are operating on the 12.5 kHz channel centers.

17. Currently, there are approximately 550 private land mobile channels spaced every 15 kHz in the 150-174 MHz band.

However, the equipment on these channels was designed to operate with a 30 kHz bandwidth. Option A would create approximately 100 new VHF channels in the near-term and ultimately would yield a total of approximately 1300 VHF channels if the Commission transitioned to 6.25 kHz channels. Moreover, Option A provides an orderly and graceful migration and backward compatibility, allowing users to gradually changeout systems.

18. Further, Option A preserves private land mobile radio users' current option to choose from a full line of cost-effective best-fit products from competitive manufacturers which match the users' particular communications and budget requirements. Over time, existing users would replace current 30 kHz bandwidth equipment, thereby reducing adjacent channel interference and eliminating the need for adjacent channel mileage separations. Doing so improves the quality of service, increases spectrum efficiency and eliminates channel overlap that could hamper the practical implementation of further channel splits.

19. While Option A would meet the Commission's goal of greatly increasing capacity in 20 years, LMCC members who favor Option B have questioned whether Option A would create enough new capacity soon enough to justify the costs that would be incurred. Other members of LMCC believe, however, that the additional capacity that would be gained under Option A over the next ten

years would provide significant improvement by alleviating spectrum shortages in specific areas of the country.

Option B

20. This option would forego the interim conversion to 12.5 kHz channelization and focus directly on a process for introducing 6.25 kHz channelization. The specific timetable to implement this conversion is as follows:

a. Effective January 1, 1994, a band plan based on 6.25 kHz channelization would be incorporated into the rules for voluntary use by licensees.

b. By January 1, 1999, the Commission would commence a follow-up rule making to review and confirm the January 1, 2004 timetable for implementation of 6.25 kHz channelization.

c. Effective January 1, 2004, all equipment type accepted by the Commission (other than for use on designated paging channels) must be capable of operating on true 6.25 kHz bandwidths or with equivalent efficiency.

d. Effective January 1, 2004, all licensees not employing true 6.25 kHz equipment or equivalent efficiency could continue to operate but such operations would be on a non-interference basis.

e. Licensees would be allowed to move to the newly designated 6.25 kHz frequencies in advance of January 1, 2004 on a coordinated basis with notification to all licensees within the affected frequency block.

21. Option B offers the advantage, from the licensees' perspective, of promoting certainty as to the direction in which the Commission is heading. Licensees will be clearly on notice that they will be required to convert to 6.25 kHz bandwidth

equipment by 2004. Additionally, the licensees will be assured that they will have to make only one wholesale conversion, as opposed to an interim conversion to 12.5 kHz bandwidths and a subsequent change to 6.25 kHz. Moreover, from the Commission's perspective, there will clearly be tangible efficiencies to be gained by tripling the number of assignable frequencies at an earlier date than under Option A.

22. However, with Option B, the introduction of more spectrally efficient measures would be slow initially and would not be fully implemented until the year 2004. For example, there would be no concerted effort to "clean up" the noise which accompanies operations in the 150-174 MHz band as a result of operating 30 kHz equipment on frequencies separated by 15 kHz. Additionally, though the industry will certainly gain experience in the coming years with very narrowband (5 kHz or 6.25 kHz) channels, Option B would place the Commission in the posture of having to develop rules now for equipment bandwidths with which there is currently little "real world" experience.

II. Implementation of Maximum Permissible Power Levels

23. The Commission has proposed stringent limits on effective radiated power (ERP) and height above average terrain (HAAT) as a means of curtailing "overly powerful systems" and of reusing channels at closer spacings. (NPRM, para. 20). For the

150-174 and 450-470 MHz bands, the Commission has proposed maximum facilities as 300 watts ERP with an antenna height at 60 meters AAT. For antenna heights greater than 60 meters, the Commission has proposed a power/height reduction table, to be codified at Section 88.429.

24. While LMCC agrees that users should not be licensed for more power than necessary, LMCC disagrees that the number of over-powered systems is so large as to warrant the drastic power limits proposed in the NPRM. These limits appear designed only to facilitate the frequency coordination process, by permitting a standard 50-mile separation between co-channel base stations, and to facilitate administration of the Exclusive Use Overlay (EUO) program. However, because of the diversity of service areas and operating requirements of licensees in the PLMRS, it is unreasonable to expect these licensees to operate such "cookie-cutter" radio systems.

25. Power limits could actually result in a net increase in spectrum use if spectrum (e.g., microwave spectrum) is required to interconnect multiple base stations that would be required to achieve coverage over a licensee's service area. Installation of additional base stations will further complicate system planning, such as by requiring use of sophisticated simulcast systems or voting systems, and will thereby increase licensee expense. In addition, installation of additional base stations to achieve

fill-in coverage will be complicated by the increasing difficulty all licensees face in securing transmitter sites, due to zoning, environmental and aeronautical concerns. LMCC therefore recommends that the Commission abandon its proposal to license only "cookie-cutter" radio systems in the PLMRS.

26. If, however, the Commission believes that standards are needed to ensure that applicants have properly matched their power requirements with their service area requirements, LMCC recommends adoption of a two-part procedure: (1) use of a "safe harbor" table of permissible ERP/HAAT combinations; or (2) submission of coverage contours demonstrating use of the minimum power necessary to meet the applicant's needs. LMCC proposes that applicants would be free to select either method. However, certain radio services could be restricted to using coverage contours if it were believed by the relevant coordinating groups that the "safe harbor" table would not meet their specialized needs. Both methods are described below.

27. If power/height limits are adopted, LMCC recommends that they be applied to all new systems licensed after the effective date of Part 88; and to all renewals and major modifications beginning two years after the effective date of Part 88. Thus, assuming an effective date of January 1, 1994, these power/height showings would be required in all applications for new systems filed after January 1, 1994, and in all

applications for major modification or renewal of license filed after January 1, 1996. All systems would therefore be in compliance with these new standards by January 1, 2001.

A. Establish A "Safe Harbor" Table of Permissible ERP/HAAT Combinations

28. To simplify the process for applicants, coordinators, and the Commission, LMCC recommends adoption of a "safe harbor" table of permissible power/height combinations, premised on: (1) the HAAT of the applicant's antenna, and (2) the applicant's required service area radius. Attached as Appendix A and Appendix C are examples of "safe harbor" tables LMCC has developed for the 150-174 MHz band and 450-470 MHz band, respectively. These tables specify the maximum ERPs allowable for a given HAAT and service area radius. The ERP/HAAT combinations in these tables are intended to place the 37 dBμ contour at VHF or a 39 dBμ contour at UHF, as determined from the F(50,50) curves, at the range of the service area category.[9]

29. Using these tables, an applicant could easily determine the maximum permissible ERP and HAAT combinations for any desired

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[9] The tables presented as part of this Consensus Plan are based on FCC R-6602 propagation curves. Even if the industry and the Commission should decide that alternative models are more appropriate, these tables remain instructive in that they illustrate a useful format, even if the specific values are ultimately modified.

service radius between 2 and 60 miles.[10] For example, an applicant in the 150-174 MHz band needing a service radius of 20 miles, and proposing an antenna at 500 feet AAT, would be permitted to transmit with up to 90 watts ERP.

30. If an applicant's power/height combination meets the limits of the table for the applicant's required service area, no further showings would be necessary.[11] An applicant needing power or height in excess of that given by the table would have the option of submitting coverage contours, as described below. Thus, an applicant could design its radio system to achieve the coverage it requires, and the table would ensure that there is at least some correlation between the power requested by the applicant and its required service area.[12]

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[10] It should be noted that the tables are premised on a maximum ERP of 1000 watts. Powers in excess of 1000 watts would be authorized only upon submission of coverage contours, as described below. The table for the 450-470 MHz band only provides limits up to 47 miles as the power required to achieve this radius, even at 5000 feet AAT, would exceed 1000 watts ERP.

[11] Since FCC Form 574 already includes columns for ERP and HAAT figures, the form would only require addition of a column for "service area radius."

[12] The maximum power/height combinations listed in the tables are premised on meeting the applicant's anticipated service area coverage requirements. However, in situations in which the applicant needs a stronger signal but not necessarily to extend coverage (for example, to ensure signal penetration into factories, plants, or underground facilities), a note to the table would provide that in such situations, the applicant could request up to the maximum ERP for the next larger service area radius. For example, an applicant with only a 2-mile service radius, but which needs to penetrate in or out of factory buildings, could request up to the maximum ERP permitted for a system with a 5-mile service radius. Co-channel coordination

31. LMCC's suggested approach will also facilitate the frequency coordination process. If the desired service area of each applicant/licensee is known, it is also possible to